

## Remarks

### Oath/Declaration

The identity of the citizenship of one of the inventors was missing from the original declaration. A new declaration of that inventor is submitted herewith.

### Drawings

The drawings were objected to as not showing the “depth indicators” of claim 5. Claim 5 has been canceled. New formal drawings are submitted herewith.

### Objection to the Specification

The specification was objected to as not including a description of Fig. 8. The foregoing amendment to the specification corrects this unintentional oversight.

### Rejection of Claims 6 and 7 under 35 U.S.C. Section 112

Claims 6 and 7 were rejected under 35 U.S.C. Section 112, second paragraph, for failing to particularly point out and distinctly claim the invention. Claims 6 and 7 have been amended to clarify that the sinusoidal element comprises a fiber composite article, as assumed by the Examiner in his examination of the claims. Reconsideration and withdrawal of the Section 112 rejection of claims 6 and 7 is respectfully requested.

### Rejection of Claims 1-3 and 6-7 under 35 U.S.C. Section 102(e)

Claims 1-3 and 6-7 are rejected under 35 U.S.C. Section 102(e). This ground of rejection is respectfully traversed.

Messenger et al. teaches the use of a plurality of carbon fiber strands 10 which are connected to an exterior carbon fiber grid 8, pass through an insulative core 4 and are connected to an interior concrete carbon fiber grid 6 (see column 4, lines 54-61). The carbon fiber strands 10 of Messenger et al. are made of a flexible carbon fiber roving or, in an alternative embodiment, a flexible ribbon/tape 30 is used in which the intersections of the strands are interconnected with a resin (column 5, line 58 – column 6, line 12). The flexible ribbon/tape 30 specified in a preferred embodiment is the MeC-GRID™ material sold by Hexcel Clark-Schwebel, which does business as TechFab, LLC. The MeC-GRID™ material, as described in the attached product profile, “comes on a roll for ease of use.” In contrast, the sinusoidal

connecting element of the present invention is formed using linear, prismatic, thermoplastic pultrusion (see the last paragraph on page 6), a process which results in a rigid composite fiber linear pultrusion which is then formed into the sinusoidal shape by heating. The sinusoidal elements of the present invention are thus rigid sinusoidal elements, not the flexible strands or ribbon/tape of Messenger et al. All of the claims have been amended to more particularly point out and distinctly claim this novel and nonobvious improvement in the art. This rigidity allows the sinusoidal elements of the present invention to be inserted into pre-cast plastic concrete, as called for in claims 2 and 4. This feature of the present claimed invention is not taught or made obvious by Messenger et al. The strands 10 or ribbon/tape 30 of Messenger et al. is connected to the grids 6 and 8 by connectors 32 (see Fig. 1). Obviously, this requires that the assembly of the interior grid 6, insulative core 4, exterior grid 8, strands 10 (or, alternatively, ribbon/tape 30), and connectors 32 must be created before the concrete layers 14 and 16 are cast on either side of this assembly. Reconsideration and withdrawal of the Section 102 rejection in light of the foregoing amendments and these remarks is respectfully requested.

Rejection of Claim 4 Under 35 U.S.C. Section 103(a)

Claim 4 was rejected under 35 U.S.C. Section 103(a) as being obvious over Messenger et al. This ground of rejection is traversed.

As acknowledged by the Examiner, Messenger et al. does not teach pushing the sinusoidal elements into the insulation layer. Applicant disagrees that it would be obvious to modify the teachings of Messenger et al. as suggested by the Examiner. The reason for this is that it is an inoperative variation of Messenger et al. Firstly, neither the strands 10 nor the ribbon/tape 30 are rigid and so cannot in any way be pushed through the insulation layer. Secondly, claim 4 recites that a first concrete layer is provided with longitudinal reinforcing elements in place. This would render Messenger et al. inoperative since the strands 10 or ribbon/tape 30 must be connected to the grids 6 and 8 and so the grids cannot be placed in the first concrete layer prior to installation of the strands 10 or ribbon/tape 30 because there would then be no way to connect the strands 10 or ribbon/tape 30 to the grid that is already embedded in the first concrete layer. Reconsideration and withdrawal of the Section 103(a) rejection light of the foregoing amendments and these remarks is respectfully requested.

Accordingly, the purpose of the claimed invention is not taught nor suggested by the cited references, nor is there any suggestion or teaching which would lead one skilled in the relevant art to combine the references in a manner which would meet the purpose of the claimed invention. The cancellation and amendments to claims should not be viewed in any way as an admission of the validity or correctness of the positions taken by the examiner in the Office Actions. Because the cited references, whether considered alone, or in combination with one another, do not teach nor suggest the purpose of the claimed invention, Applicant respectfully submits that the claimed invention, as amended, patentably distinguishes over the prior art, including the art cited merely of record.

Based on the foregoing, Applicant respectfully submits that its claims 1-5 and 6-7, as amended, are in condition for allowance at this time, patentably distinguishing over the cited prior art. Accordingly, reconsideration of the application and passage to allowance are respectfully solicited.

The Examiner is respectfully urged to call the undersigned attorney at (515) 288-2500 to discuss any remaining issues that may exist or arise.

Respectfully submitted,

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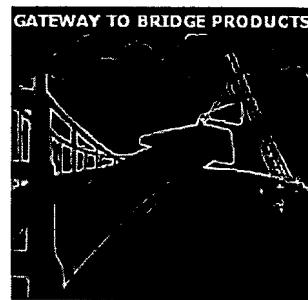
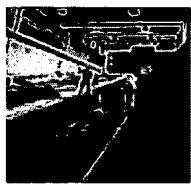
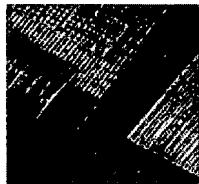
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## FRP PRODUCT GATEWAY: EXTERNAL REINFORCEMENT SYSTEMS



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### Company and Product Profile

TechFab, LLC is headquartered in Anderson, SC and manufacturers adhesive bonded scrims, scrim composites, and MeC-GRID® Structural Grids using fiber glass, carbon, polyester, Kevlar®, Twaron®, Spectra®, Vectran®, and other high performance fibers. TechFab is a joint venture between Hexcel Corporation and Les Fils d'A Chomarat & Cie of Mariac, France. TechFab has been in business since 1985.

TechFab offers its MeC-GRID® line of structural grids as an External Reinforcement System for repair, strengthening and seismic retrofit applications. MeC-GRID is a high performance reinforcement made by bonding advanced fiber systems (glass and carbon fibers for external reinforcement systems) with epoxy resin in a closely controlled manufacturing environment. MeC-GRID structural grids are used with either a two-part epoxy adhesive, polymer concrete or a similar type adhesive system, which in turn

bonds itself to the external structure to provide the proper degree of repair, containment or strengthening. Structural grids are relatively thin with the thickness ranging from 0.020" to about 0.125". As such, grids are relatively easy to cut using heavy-duty scissors or tin snips. The material comes on a roll for ease of use. Grids, being composite materials, are light in weight and very strong. The manufacturing process used to produce grids insures that all fiber bundles are wet out and fibers in both warp and weft direction is uniformly tensioned to insure consistent and uniform fiber loading.

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